

**Amendments to the Claims:** This listing of claims will replace all prior versions, and listings, of claims in the application

**Listing of Claims:**

1. (Current Amended) A method of decomposing nitrogen dioxide (NO<sub>2</sub>) to nitrogen monoxide (NO) in an exhaust gas of a lean-burn internal combustion engine, which method comprising:
 

adjusting the C1 hydrocarbon : nitrogen oxides (C1 HC:NO<sub>x</sub>) ratio of the exhaust gas to from 0.1 to 2; and

contacting ~~this the~~ gas mixture from the adjusting step with a particulate acidic refractory oxide selected from the group consisting of zeolites, tungsten-doped titania, silica-titania, zirconia-titania, gamma-alumina, amorphous silica-alumina and mixtures of any two or more thereof, wherein the particulate refractory oxide supports a metal or a compound thereof, which metal is selected from the group consisting of rhodium, palladium, iron, copper and mixtures of any two or more thereof; and

passing the effluent gas from the contacting step to atmosphere.
2. (Cancelled)
3. (Currently Amended) TheA method according to Claim 1 ~~or 2, wherein further comprising adjusting the~~ C1 HC:NO<sub>2</sub> ratio ~~is adjusted to~~ from 0.05 to 1.
4. (Currently Amended) TheA method according to claim 1, ~~2 or 3,~~ wherein the step of adjusting the C1 HC:NO<sub>x</sub> ratio in the exhaust gas ~~is occurs at temperatures done at above between about 250°C and about 500°C.~~
5. (Cancelled)
6. (Cancelled)
7. (Currently Amended) An exhaust system for an internal combustion engine, which system ~~comprising~~ comprises:

a catalyst for decomposing nitrogen dioxide (NO<sub>2</sub>) to nitrogen monoxide (NO) with a suitable reductant; and

means, in use, for adjusting the a C1 hydrocarbon : nitrogen oxides (C1 HC:NO<sub>x</sub>) ratio in an exhaust gas upstream of the catalyst to from ~~0.01~~0.1 to 2, which catalyst consisting of a particulate acidic refractory oxide selected from the group consisting of ~~zeolites~~zeolite, tungsten-doped titania, silica-titania, zirconia-titania, gamma-alumina, amorphous silica-alumina and mixtures of any two or more thereof, ~~optionally supporting a metal or a compound thereof, which metal being selected from the group consisting of rhodium, palladium, iron, copper and mixtures of any two or more thereof.~~

8. (Currently Amended) ~~The~~An exhaust system according to claim 7, wherein ~~at least one the particulate refractory oxide is a zeolite is selected from the group consisting of ZSM-5,  $\beta$ -zeolite, Y-zeolite, or mordenite, and mixtures of any two or more thereof.~~
9. (Cancelled)
10. -22. (Cancelled)
23. (Currently Amended) ~~An~~The exhaust system according to ~~any of claims~~claim 7 to 22, wherein ~~the~~further comprising a means, in use, for adjusting is adapted to adjust the a C1 HC:NO<sub>2</sub> ratio of the exhaust gas to from 0.05 to 1.
24. (Currently Amended) ~~An~~The exhaust system according to ~~any of claims~~claim 7 to 23, wherein the adjustment means is controlled, in use, to operate when the exhaust gas temperature is ~~above~~between about 250°C and about 500°C.
25. (Cancelled)
26. (Currently Amended) ~~An~~The exhaust system according to ~~any of claims~~claim 7 to 25, wherein the adjustment means comprises a control means comprising a processor.
27. (Cancelled)
28. (Currently Amended) ~~An~~The exhaust system according to claim 26 ~~or 27~~, wherein the control means adjusts the C1 HC:NO<sub>x</sub> ratio in response to one or more of the following inputs: exhaust gas temperature; catalyst bed temperature; rate of exhaust gas mass

flow; NO<sub>2</sub> in the exhaust gas; manifold vacuum; ignition timing; engine speed; throttle position; lambda value of the exhaust gas composition; quantity of fuel injected in the engine; position of an exhaust gas recirculation valve; and boost pressure.

29. (Currently Amended) ~~An~~The exhaust system according to claim 28, wherein the control means is operated according to stored look-up tables or an engine map in response to the at least one input.
30. (Currently Amended) ~~An~~The exhaust system according to ~~any of claims~~claim 7 to 29, wherein the means for adjusting the C1 HC:NO<sub>x</sub> ratio comprises at least one of: means for injecting a reductant into the exhaust gas; means for adjusting ~~the~~an ignition timing of at least one engine cylinder; means for adjusting fuel injection timing of at least one engine cylinder; means for adjusting ~~the~~an engine air-to-fuel ratio; and means for adjusting an~~adjustment of~~ exhaust gas recirculation rate.
31. (Currently Amended) ~~The~~An exhaust system according to ~~any of claims~~claim 7 to 30, wherein the NO<sub>2</sub> decomposition catalyst is disposed downstream of an oxidation catalyst, wherein the oxidation catalyst comprises~~comprising~~ at least one PGM, ~~preferably at least one of platinum and palladium.~~
32. (Currently Amended) ~~An~~The exhaust system according to claim ~~33~~31, further comprising a particulate filter disposed between the oxidation catalyst and the NO<sub>2</sub> decomposition catalyst.
33. (Cancelled)
34. (Cancelled)
35. (Currently Amended) ~~An~~The exhaust system according to claim 32, ~~33 or 34~~, wherein the NO<sub>2</sub> decomposition catalyst is disposed on a downstream end of the filter.
36. (Cancelled)
37. (Currently Amended) ~~The~~An exhaust system according to ~~any of claims~~claim 30 to 36, ~~when appendant to claim 30~~ wherein the reductant injecting means introduces the reductant into the exhaust system upstream of the NO<sub>2</sub> decomposition catalyst and downstream of ~~any~~a PGM oxidation catalyst.

38. (Currently Amended) ~~An internal combustion engine comprising an~~The exhaust system according to ~~claim~~many of claims 7, to 37 mounted in an internal combustion engine.
39. (Currently Amended) ~~An~~The exhaust system according to claim 38, wherein the engine according to claim 38~~is~~ fuelled with diesel fuel, gasoline fuel, natural gas (NG) or liquid petroleum gas (LPG), ~~preferably diesel fuel.~~
40. (Currently Amended) The exhaust system according to claim 38 mounted in a miningA vehicle,~~such as mining vehicle, comprising an engine according to claim 38 or 39.~~
41. (New) The exhaust system of claim 7 wherein the particulate refractory oxide further supports a metal or a compound thereof, which metal is selected from the group consisting of rhodium, palladium, iron, copper and mixtures of any two or more thereof.
42. (New) The exhaust system of claim 31, wherein the at least one PGM metal is selected from the group consisting of platinum, palladium, and mixtures thereof.